CodeWarrior®

QuickStart Professional

Because of last-minute changes to CodeWarrior, some of the information in this manual may be inaccurate. Please read the Release Notes on the CodeWarrior CD for the latest up-to-date information.

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B Software License **73**

1 Welcome

Welcome to CodeWarrior Professional from Metrowerks, the flexible, powerful, easy to use programming package for Microsoft® Windows®, Mac® OS, and Java™. Use CodeWarrior Professional on Windows or Mac OS to write software in C, C++, Pascal, or Java to run on Windows, Mac OS, or Java VM.

Whether you're brand new to programming or an experienced programmer getting your first taste of CodeWarrior, we want your programming experience to be a good one. Read this guide as an introduction to the all powerful CodeWarrior Professional.

Getting started

If you can't wait to dive in and get started using CodeWarrior, see "Get Started, Quick!" on page 8.

What's in this book

To find out what's in this book, see "About this Book" on page 9.

Getting help

Got a problem you can't solve? If you run into a problem while trying to use CodeWarrior that isn't covered in this book or any other CodeWarrior documentation, see "Metrowerks Support" on page 65 for information on contacting Metrowerks for technical and customer support.

CodeWarrior Reference Web Site

CodeWarrior Professional comes with an entire Web site on your computer to guide you through the tutorials, documentation, and on-line books included with your CodeWarrior software.

Windows

To access the CodeWarrior Reference Web Site under Windows:

1. **Click the Start button in the Taskbar.**
2. **Navigate to the CodeWarrior IDE/Integrated Debugger by using the following path Start->Programs->CodeWarrior Pro4->CodeWarrior. The CodeWarrior IDE/Integrated Debugger is installed in the Programs sub-menu by default.**
3. **Choose CodeWarrior Reference Web Site.**

Mac OS

To access the CodeWarrior Reference Web Site under Mac OS:

1. **Locate and open the CodeWarrrior IDE/Integrated Debugger folder on your hard disk.**
2. **Double-click the Reference Web Site icon in the Metrowerks folder.**

NOTE: The **CodeWarrior Reference Web Site** uses specific features found in Microsoft Internet Explorer. Although you may use other Web browser applications to view the site, Metrowerks recommends Internet Explorer to take full advantage of the Reference Web site. If you are using a browser other than Internet Explorer make sure it is set up to use Adobe Acrobat to open ".PDF" files.

Get Started, Quick!

The quickest way to learn what CodeWarrior is all about is to follow the steps below.

1. **Read the software license.**

   Please read the "Software License" on page 73 and make sure you understand and agree with it before installing your new software.

2. **Register CodeWarrior.**

   Make sure you've registered your software to receive free technical support and any free or discounted updates you might be entitled to for a year from date of purchase. See "Registering CodeWarrior" on page 11 for more information.

3. **Introduce yourself to CodeWarrior.**

   See "Overview" on page 13 to learn about using the different parts of CodeWarrior to develop software.

4. **Install CodeWarrior.**

   To install your new software on your computer, follow the directions for your computer system:

   - see "Installing CodeWarrior on Windows" on page 21 to install CodeWarrior for the Windows platform.
   - see "Installing CodeWarrior on Mac OS" on page 29 to install CodeWarrior for the Mac OS platform.

5. **Take a tour of the CodeWarrior IDE.**

   Turn to "A Quick Tour of CodeWarrior" on page 35 for a short, step-by-step exploration of the CodeWarrior IDE (Integrated Development Environment), the center of CodeWarrior software development.

6. **Learn about the rest of CodeWarrior.**

   See "Using CodeWarrior" on page 59 to learn and find more information about other features of CodeWarrior.

About this Book

This *QuickStart Professional* book covers:

- what's in the CodeWarrior Professional software package
- how to install CodeWarrior Professional
- a brief introduction to the CodeWarrior IDE (Integrated Development Environment), the center of CodeWarrior software development
- where to find more information on using CodeWarrior

- getting technical and customer support from Metrowerks
- Information about Metrowerks Year 2000 Compliance

The chapters in *QuickStart Professional* cover the topics shown in Table 1.1.

Table 1.1 Chapters in this book and the topics they cover

This chapter…	covers these topics
"Welcome" on page 7	introduction to this book, the CodeWarrior Reference Web Site, getting started, eligibility for free and discounted updates, Metrowerks Year 2000 policy, what's new, what you should know before using CodeWarrior
"Overview" on page 13	programming tools, host platforms, programming languages, target platforms, application frameworks, introduction to documentation and example projects
"Installing CodeWarrior on Windows" on page 21	system requirements and steps for installing CodeWarrior Professional on Microsoft Windows
"Installing CodeWarrior on Mac OS" on page 29	system requirements and steps for installing CodeWarrior Professional on Mac OS
"A Quick Tour of CodeWarrior" on page 35	brief introduction to the CodeWarrior IDE, the center of CodeWarrior software development
"Using CodeWarrior" on page 59	getting and applying updates, references to other information on using CodeWarrior

This chapter…	covers these topics
"Metrowerks Support" on page 65	contacting Metrowerks and its distributors for technical support, customer support, and other services
"Software License" on page 73	the conditions to using this software

Registering CodeWarrior

Did you just buy this software?

If this is the first time you've purchased CodeWarrior, fill in the registration cared and send it to Metrowerks to receive free technical support for a year from date of purchase.

See "Registration and Updates" on page 65 for details on registering your new Metrowerks product.

Is this your last update?

If this is your last product update, read "Registration and Updates" on page 65 for information about further updates so you can continue to receive the latest CodeWarrior tools.

What's New

To find out what's new with CodeWarrior Professional, see:

- What's New release note

  The What's New release note is located in the top directory of the CodeWarrior CD-ROM. It contains a broad overview of the major changes offered in this release of CodeWarrior.

- `Release Notes` folder

  The `Release Notes` folder on the CD contains detailed release notes for the software in this product.

- Metrowerks documentation

  Finally, many of the Metrowerks documentation manuals contain a What's New section describing new features.

Metrowerks Year 2000 Compliance

The Products provided by Metrowerks under the License agreement process dates only to the extent that the Products use date data provided by the host or target operating system for date representations used in internal processes, such as file modifications. Any Year 2000 Compliance issues resulting from the operation of the Products are therefore necessarily subject to the Year 2000 Compliance of the relevant host or target operating system. Metrowerks directs you to the relevant statements of Microsoft Corporation, Sun Microsystems, Inc., Apple Computer, Inc., and other host or target operating systems relating to the Year 2000 Compliance of their operating systems. Except as expressly described above, the Products, in themselves, do not process date data and therefore do not implicate Year 2000 Compliance issues.

For additional information, visit: `http://www.metrowerks.com/about/y2k.html`.

What You Should Know

To get the most out of this software, you should be familiar with operating your computer, using the mouse, menus, buttons, windows, clicking, dragging, and so on. If you're not familiar with these terms or the actions associated with them, please refer to the instructions in the user's guide or the on-line help system that come with your computer.

2

Overview

This chapter introduces you to the CodeWarrior development universe. With CodeWarrior, no programming project is out of your reach. The overview covers the following topics:

- The CodeWarrior IDE
- Multiple Programming Hosts
- Multiple Languages
- Multiple Programming Targets
- Libraries and Application Frameworks
- CodeWarrior Documentation

The CodeWarrior IDE

The CodeWarrior IDE (Integrated Development Environment) is the center of CodeWarrior software development. The IDE offers:

- **Power** – From the IDE you can edit, browse, compile, link, and run your project. The IDE includes a text editor, class browser, and a project manager to help you do all your programming tasks easily and quickly.
- **Flexibility** – Plug-in compilers and linkers support many different platforms and processors. The same powerful IDE is used to develop and generate software for such targets as Win32®/Intel, Mac OS®, MIPS™, Motorola® 680x0, and PowerPC™.
- **Convenience** – The IDE running both on Windows as well as Mac OS are based on the same technology. Because the IDE and its plug-ins operate identically for all platforms, developers who program on multiple platforms save time and effort using the familiar CodeWarrior tools for all their projects.

The IDE's core tools are the tightly and transparently integrated primary components used to write code. Table 2.1 describes some of the individual components included with the CodeWarrior IDE.

Table 2.1 The IDE's core tools

This tool…	Provides these features and functions
project manager	Use the commands in the IDE's **Project** menu to gather all the files of a program together along with configurable sets of options into a project file, and decides for you which plugin compilers and linkers to act on the project to create the final program.
source code editor	Use the commands in the **Edit** and **Search** menus, and the controls in the IDE's editor windows to edit source code and text. Some of the editor's features are: • edit, search, and replace text in one file or several files • split an editor window into multiple panes • toggle between a source file and its related interface file • open an interface file referred to by a source file • set markers at arbitrary locations in a text file • jump to any routine in any file instantly • customize the source code display
browser	Use the commands in the **Window** menu, features in any source code view, and controls in the browser's window to get quick, intuitive access to the definitions of classes, variables, routines, enumerations, and other source code elements.

This tool…	Provides these features and functions
compilers and linkers	Thanks to its plugin architecture, the IDE is able to play host to a limitless variety of compilers and linkers to generate software for several operating system and processor platforms.
debugger	Use the commands in the **Window**, **Debug**, and **Data** menus to control your program, step through its source code or assembly statements, set breakpoints, set watchpoints, and examine its data while it executes. The IDE's debugger works with all kinds of code in all the supported languages—C, C++, Pascal, and Java. Use the debugger to debug libraries, executables, multiple threads, and processes. The debugger also supports debugging code running on multiple processors.

Some Metrowerks products do not include support for all available core tools. See the documentation to determine which core tools are included in your package.

Multiple Programming Hosts

Metrowerks CodeWarrior is currently hosted on these platforms:

- Windows 95 or Windows NT
- Mac OS (68K or PowerPC)
- BeOS

This makes it easy to switch to another platform as your programming requirements change while retaining the familiar CodeWarrior development environment.

Multiple Languages

CodeWarrior Professional supports development with the most common languages used by professional programmers today: C, C++, Java, and Pascal. Table 2.2 shows the list of compilers Metrowerks provides to generate software for its target platforms.

Table 2.2 Language supported for targets

Target platform	C	C++	Java	Pascal
BeOS	•	•	•	
Java Virtual Machine			•	
Mac OS (68K and PowerPC)	•	•	•	•
Palm OS	•	•		
Sony PlayStation or Net Yaroze	•	•		
Win32/Intel	•	•	•	•

Some Metrowerks products do not include support for all available languages. See the documentation to determine which language(s) are included in your package.

Multiple Programming Targets

Use CodeWarrior on your host system to write software for many operating system and processor platforms (targets). Table 2.3 shows you some of the major targets supported by each host.

Table 2.3 Programming targets and their host development platforms

Target platform	Windows	Mac OS	BeOS
BeOS			•
Java Virtual Machine	•	•	•
Mac OS (68K & PPC)	•	•	
Palm OS	•	•	

Target platform	Windows	Mac OS	BeOS
Sony PlayStation or Net Yaroze	•	•	
Win32/Intel	•	•	

The CodeWarrior product you purchased does not include compilers and linkers for every possible target. Check the documentation for a list of targets supported by the product.

Libraries and Application Frameworks

Standard libraries

CodeWarrior includes standard libraries with its compilers, when appropriate for a target platform. CodeWarrior Professional includes MSL (Metrowerks Standard Library) for C and C++ for Win32/Intel and Mac OS. MSL C and MSL C++ are ANSI-conformant standard libraries. For Pascal, CodeWarrior supplies "built-in" routines to conform to ANS Pascal, Turbo Pascal, and MPW Pascal.

Target libraries

To access the services and features of a target platform's operating system, the CodeWarrior IDE/Integrated Debugger also includes libraries and interface files from the target platform's manufacturer. For example, CodeWarrior Professional comes with Microsoft's Win32 SDK header files to develop software for the Win32/Intel platform.

Application frameworks

Programming for modern, graphical operating systems like Mac OS, Windows 95/NT, and Java is non-trivial, and that's where an application framework helps. A framework supplies standardized code to handle many common programming tasks, making the creation and design of a new application much easier and faster.

The CodeWarrior comes with several complete application frameworks, one for each major CodeWarrior target.

Table 2.4 Frameworks supported

Framework	Target platform
AWT (Abstract Windowing Toolkit)	Java
MFC (Microsoft Foundation Classes)	Windows
PowerPlant	Mac OS

CodeWarrior Documentation

CodeWarrior comes with a wealth of online documentation. This is found in the `CodeWarrior Documentation` folder on the CodeWarrior Professional Reference CD-ROM or through the CodeWarrior Reference Web Site installed on your computer's hard drive. For more information on using documentation to learn about CodeWarrior, see "Using CodeWarrior."

Finding information for a specific target platform

To learn the use CodeWarrior to develop software for a particular target platform, refer to the appropriate *Targeting* manual that comes with CodeWarrior Professional. For example, to learn and develop an application or DLL for Win32/Intel using CodeWarrior, read *Targeting Win32*.

Every *Targeting* manual has the following:

- a description of the tools you'll use to develop software for the target platform it covers
- a tutorial project
- steps to configure different kinds of projects for the platform
- relevant libraries and other useful information

Getting printed documentation

Some manuals titled *Inside CodeWarrior* are available as printed books. Contact your local distributor or browse the Metrowerks Web page (`http://www.metrowerks.com`) for information.

Example Projects

CodeWarrior Professional comes with lots of sample source code and projects to give you an insight into how others use CodeWarrior to develop software. You'll find this sample software in the `CodeWarrior Examples` folder on the CodeWarrior Professional Reference CD-ROM.

3

Installing CodeWarrior on Windows

This chapter explains the installation procedure for the CodeWarrior Professional software package on PCs running Microsoft® Windows®. The topics in this chapter are:

- Windows System Requirements
- Before You Install on Windows
- Installation Procedure on Windows
- What's Installed on Windows

Windows System Requirements

The CodeWarrior IDE/Integrated Debugger requires the following hardware and software:

Table 3.1 Windows Requirements

Hardware	Intel Pentium-class processor (recommended), or 80486-class processor, 16 megabytes of RAM, CD-ROM drive
Software	Windows NT 4.0 or greater (recommended) or Windows 95 or later
Other	120 MB free hard disk space (minimum install)

Before You Install on Windows

Before installing the software on your Windows computer, you should:

1. **Read the CodeWarrior/Metrowerks Software License.**

   Make sure you understand and agree with the "Software License" on page 73 before installing the software.

2. **Make sure your software package is complete.**

   This software package should contain:

   1. *QuickStart Professional* guide (optional on some products and updates)
   2. A *CodeWarrior Professional Windows Tools* CD
   3. A *CodeWarrior Professional Reference* CD
   4. A registration card (optional on some products and updates)
   5. Geekware catalog

   NOTE: If any of these items are missing, contact your local distributor or Metrowerks sales (`sales@metrowerks.com`). See "Metrowerks Support" on page 65 for more information.

3. **Make sure your computer system meets the specified hardware and software requirements.**

   See "Windows System Requirements" on page 21.

4. **Quit all running applications before installing.**

   To avoid installation problems, it is highly recommended that you quit all running applications before launching the CodeWarrior installation software.

   WARNING! Be sure to turn off all virus protection software before running the installation software.

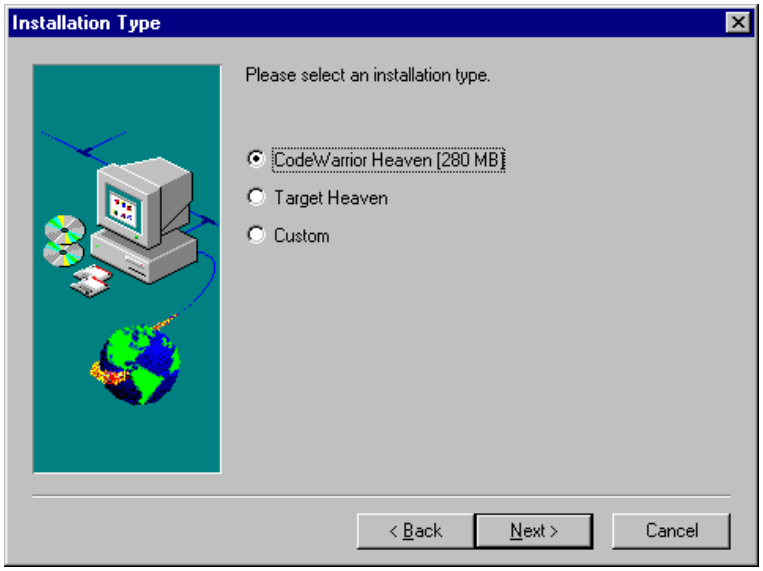
Installation Overview on Windows

The installation software on the CodeWarrior Professional Windows Tools CD-ROM installs all the necessary components you will need to use CodeWarrior. The installation software presents the options listed in Table 3.2.

Table 3.2 Installation types for Windows

This option…	Installs these items on your hard disk
CodeWarrior Heaven	all CodeWarrior development tools, compilers, linkers, libraries, and help files for all target platforms
Target Heaven	the tools, compilers, linkers, libraries, and help files for only the target platforms you choose
Custom	only the components you choose

Figure 3.1 Metrowerks installation options



Installation Procedure on Windows

To install CodeWarrior Professional on a Windows computer:

1. **Back up and remove previous versions of CodeWarrior.**

   The installation software on CodeWarrior Professional can't successfully install a new version of CodeWarrior if an older version of CodeWarrior already exists on your computer. To remove the old version of CodeWarrior, launch the **Uninstall CodeWarrior** program. This program is available from the **Start** menu.

2. **Launch the CodeWarrior installation program.**

   Insert the *CodeWarrior Professional Windows Tools* CD-ROM into your CD-ROM drive.

   If the **Auto Insert Notification** setting for your CD-ROM drive is enabled, a dialog box will appear automatically when the CD is in-

serted or when you double-click the CD icon. Click **Launch CodeWarrior Setup** to begin installing CodeWarrior.

Alternatively, double-click the CD icon, then double-click the file named `Setup.exe` in the CD's top folder to begin installing CodeWarrior.

In a moment a window will appear, welcoming you to CodeWarrior Setup. Click **Next** to continue to the software license.

TIP: You can click **Cancel** anytime during the setup process to stop the installation and exit the installation program.

3. **Read the software license.**

   When the software license appears, please read it. If you agree, click **Next** to continue to choose the installation type.

4. **Choose your installation type.**

   See "Installation Overview on Windows" on page 23 for a description of the options in the setup window. Click **Next** to continue to choose the destination to install the CodeWarrior software.

5. **Select a destination for the files.**

   Choose location to install CodeWarrior on your hard disk. To accept the default location, just click **Next** to continue.

   To change the location, click **Browse** to display a dialog box prompting you for a directory. Choose a new destination directory, click **OK**, then click **Next** to continue.

6. **Choose your installation components (Custom and Target Heaven installation types only).**

   If you choose Custom or Target Heaven in step 4. then select the components you'd like to install on your computer's hard disk. Click **Next** to continue.

7. **Select a folder in the Shortcut menu.**

   Choose the folder in the Shortcut menu that will display the CodeWarrior shortcuts as they'll appear in the **Start** menu, then click **Next**.

8. **Review your choices.**

   Review all your installation choices. If you aren't satisfied, use the **Back** button to make changes. Otherwise, click **Next** to start the install operation. This might take several minutes.

9. **After installation, read the release notes.**

   After installation, please read the file **"What's New"** for the latest release information, and refer to the `Release Notes` directory for additional release details. For information on CodeWarrior's Y2K compliance, please read the note on "Metrowerks Year 2000 Compliance" on page 12.

10. **Install CodeWarrior documentation and examples.**

    Repeat steps 1 through 8 using the *CodeWarrior Professional Reference* CD to install the CodeWarrior documentation, programming examples, third-party books, and other programming goodies.

> **TIP:** Some of the documentation on the Reference CD exists in uncompressed format to allow direct viewing on the CD.

11. **Install Microsoft Internet Explorer.**

    Microsoft Internet Explorer (MSIE) is required to fully access the CodeWarrior Reference Web Site. Although you may use other Web browser applications, Internet Explorer employs the features of the Reference Web site to its fullest capabilities. If you are using a browser other than Internet Explorer make sure it is set up to use Adobe Acrobat to open ".PDF" files.

    If you don't already have MSIE on your hard disk, installation software is in the `Doc Viewers` directory on the *CodeWarrior Professional Windows Tools* CD.

12. **Install Adobe Acrobat.**

    To read documents in the Reference Web Site, you must have Adobe Acrobat Reader installed on your hard disk. The Adobe Acrobat installation software is available in the root directory on the *CodeWarrior Professional Windows Tools* CD. Open the `Acrobat Reader` directory in the `Doc Viewers` directory and double-click the executable file to install Acrobat Reader.

What's Installed on Windows

Once the installation software is finished, you will have a `Metrowerks` folder installed on your hard disk. Inside will be all the components you chose during installation. See the documentation for information on what has been installed.

4

Installing CodeWarrior on Mac OS

This chapter explains the installation procedure for the CodeWarrior Professional software package on Mac® OS computers. The topics in this chapter are:

- Mac OS System Requirements
- Before You Install on Mac OS
- Installation Overview on Mac OS
- Installation Procedure on Mac OS
- What's Installed on Mac OS

Mac OS System Requirements

CodeWarrior requires the following hardware and software setup.

Table 4.1 Mac OS requirements

Hardware	PowerPC (recommended) or MC68040 processor, 24 megabytes of RAM (32 megabytes of RAM recommended), a CD-ROM drive
Software	Mac OS System 7.5 or later, 68K-based Mac OS computers require CFM 68K Enabler 4.0 (provided by the CodeWarrior installation software for system software before Mac OS 8)
Other	120 MB free hard disk space (minimum install)

Before You Install on Mac OS

Before installing the software on your Mac OS computer, you should:

1. **Read the CodeWarrior Software License.**

   Make sure you understand and agree with the "Software License" on page 73 before installing the software.

2. **Make sure your software package is complete.**

   This software package should contain:

   1. *QuickStart Professional* guide (optional on some products and updates)
   2. A *CodeWarrior Professional Mac OS Tools* CD
   3. A *CodeWarrior Professional Reference* CD
   4. A registration card (optional on some products and updates)
   5. Geekware catalog

   NOTE: If any of these items are missing, contact your local distributor or Metrowerks sales (`sales@metrowerks.com`). See "Metrowerks Support" on page 65 for more information.

3. **Make sure your computer system meets the specified hardware and software requirements.**

   See "Mac OS System Requirements" on page 29.

4. **Quit all running applications before installing.**

   To avoid installation problems, it is highly recommended that you quit all running applications before running the Metrowerks software installer.

   WARNING! Be sure to turn off all virus protection and file sharing software before running the installer.

Installation Overview on Mac OS

The installation software on the CodeWarrior Professional Mac OS Tools CD-ROM installs all the necessary components you need to use CodeWarrior. The installation software presents the options listed in Table 4.2.

Table 4.2 Installation options for Mac OS

This option…	Installs these items on your hard disk
Full Mac OS Install	all CodeWarrior development tools, compilers, linkers, libraries, and help files for developing software for Mac OS
Full Java Install	all CodeWarrior development tools, compilers, linkers, libraries, and help files for developing software for Java™ VM (Virtual Machine)
Win32/x86 Install	all CodeWarrior development tools, compilers, linkers, libraries, and help files for developing software for the Microsoft® Win32 API running on Intel®-compatible x86 processors
Academic Minimal Install for 68K	only essential CodeWarrior development tools, compilers, linkers, libraries, and help files for developing software for Mac OS 68K
Academic Minimal Install for PPC	only essential CodeWarrior development tools, compilers, linkers, libraries, and help files for developing software for PPC
Custom Options	Enables you to customize installation and choose options based on project requirements.

Figure 4.1 CodeWarrior installer options

TIP: To get more information about an option, click the I button to the item's right. A dialog will appear displaying the option's size and content.

Installation Procedure on Mac OS

To install CodeWarrior Professional on your Mac OS computer:

1. **Launch the CodeWarrior installation software.**

   Insert the *CodeWarrior Professional Mac OS Tools* CD-ROM into your CD-ROM drive and wait for the CD's icon to appear on the computer's desktop.

   Double-click on the CD's icon. Then double-click the file named `CWPro 4 Tools Installer` in the CD's top folder to launch the application and display the welcome screen.

   Click **Continue** to display the software license for CodeWarrior Professional.

2. **Read the software license.**

   If you agree with the license, click **Accept** to display the release notes message.

3. **Read the release notes.**

   When the release notes appear, please read them. Then click **Continue** to display the options window. For information on CodeWarrior's Y2K compliance, please read the note on "Metrowerks Year 2000 Compliance" on page 12.

4. **Select a destination for the files.**

   Choose location to install CodeWarrior on your hard disk using the Install Location popup menu (Figure 4.2).

Figure 4.2 Install Location

Choose the **Select Folder** from the popup menu to install to a specific folder on the currently selected disk drive. Click **Switch Disk** to choose the next available disk drive.

5. **Choose your installation options.**

   See "Installation Overview on Mac OS" on page 31 for descriptions of the installable items. After choosing the components to place on your computer, click **Install**. The CodeWarrior installation process may take several minutes.

6. **After installation, read the release notes.**

   If installation software might recommends restarting your computer, do so to make sure any system extensions are properly initialized before using CodeWarrior. Then please read the file "What's New" for the latest release information, and refer to the `CW Release Notes` folder for additional release details.

7. **Install CodeWarrior documentation and examples.**

   Repeat steps 1 through 6 using the "CWPro 4 Reference Installer" application on the *CodeWarrior Professional Reference* CD to install the CodeWarrior documentation, programming examples, third-party books, and other programming goodies.

   TIP: Some of the documentation on the Reference CD exists in uncompressed format to allow direct viewing on the CD.

8. **Install Microsoft Internet Explorer.**

   Microsoft Internet Explorer (MSIE) is required to fully access the CodeWarrior Reference Web Site. Although you may use other Web browser applications, you will not be able to take full advantage of the Reference Web Site's features. If you are using a browser other than Internet Explorer make sure it is set up to use Adobe Acrobat to open PDF files.

   If you don't already have MSIE on your hard disk, launch its installation software in the `Documentation Viewers` folder on the *CodeWarrior Professional Reference* CD.

9. **Install Adobe Acrobat.**

   To read documents in the Reference Web Site, you must have Adobe Acrobat Reader installed on your hard disk. If you don't already have Acrobat on your hard disk, launch its installation software in the `Documentation Viewers` folder on the *CodeWarrior Professional Reference* CD.

What's Installed on Mac OS

Once the installation software is finished, you will have a `Metrowerks` folder installed on your hard disk. Inside will be all the components you chose during installation. See the documentation for information on what has been installed.

5

A Quick Tour of CodeWarrior

This short tour gives new users a glimpse of the CodeWarrior Integrated Development Environment (IDE). The tour is an abridged version of the *Core Tutorials* which comes with CodeWarrior Professional. For a broader overview of CodeWarrior follow the *Core Tutorials*.

Guided Tour Overview

The CodeWarrior IDE (Integrated Development Environment) is the center of CodeWarrior software development. From the IDE you edit, browse, compile, link, debug, and do many other programming tasks.

In this quick tour, you'll learn to do these tasks while working on an example project, `gnu_go.mcp`:

- Launching the CodeWarrior IDE
- Setting IDE Preferences
- Opening a CodeWarrior Project
- Using the Project Window
- Using the CodeWarrior Editor
- Setting Target Options
- Building Projects with CodeWarrior
- Where to Go From Here

Launching the CodeWarrior IDE

In this section you learn how simple it is to launch the CodeWarrior IDE, thereby opening the gateway to a powerful set of programming tools and beginning your career as a code warrior.

Before you can begin learning about the CodeWarrior IDE, you'll need to launch it.

Windows - Click the **Start** button in the Task bar, choose **Programs**, choose **Metrowerks CodeWarrior**, then choose the **CodeWarrior IDE** item.

The **CodeWarrior IDE** item will be in a different place in the Start menu if you didn't use the Start menu default setting while installing CodeWarrior.

Mac OS- Double-click the CodeWarrior IDE icon in the `Metrowerks CodeWarrior` folder.

The CodeWarrior IDE application launches, and its menu bar appears at the top of the screen.

Solaris- Type `runide` in any terminal window.

NOTE: This procedure of launching the IDE on Solaris assumes that the CodeWarrior directory has been included in your path.

The next section shows you how to customize the IDE.

Setting IDE Preferences

With the CodeWarrior IDE up and running, let's introduce you to the Preferences dialog box. You use the Preferences dialog box to set options that apply to all projects you will work with in the CodeWarrior IDE.

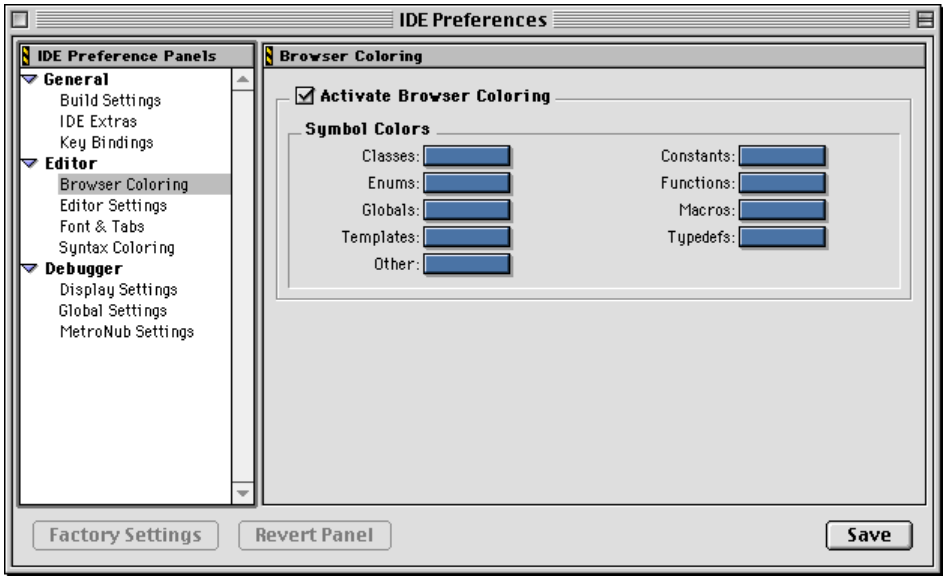
This section shows you how to do these tasks with the Preferences dialog box:

- Opening the Preferences Dialog Box
- Viewing and Setting Options in Preference Panel
- Closing the Preferences Dialog Box

Opening the Preferences Dialog Box

To change a preference, the Preferences dialog box must be open. To open the Preferences dialog box choose **Preferences** from the **Edit** menu. The Preferences dialog box appears on the screen (Figure 5.1).

Figure 5.1 The Preferences dialog box



Let's take a moment to identify some of the items in the Preferences dialog box.

- **IDE Preference Panels List** in the **Edit** menu appears on the left side of the window. It shows a list of available **preference panels**. Selecting an item in this list displays its corresponding panel on the right side of the window.
- **Preference Panel** is a subpanel and displays the panel selected in the **IDE Preference Panels** list. Changes made in the panel are reflected in all new projects you create afterward.

NOTE: The preference panels are fully discussed in the IDE User Guide.

The Preferences dialog box has three buttons that are always available to assist you in setting the various preference panel options (Figure 5.2).

Figure 5.2 The Preference window's buttons

These buttons are:

- **Factory Settings** button resets the current panel to the default settings. Using Factory Settings only affects the current panel's settings.
- **Revert Panel** button restores the current panel settings to its initial state,i.e., when the panel was first opened. Click this button if, after making changes to a panel's options, you decide the original settings were just fine.
- **Save** button commits any changes made in the preference panel. Once you're satisfied with the settings in the panel, click Save to commit to the changes.

Viewing and Setting Options in Preference Panel

There are several different preference panels available in the Preference Panels list. To set a particular preference, you must choose its panel.

To view a Preference panel, click the panel name in the Preference Panel list or use the Up and Down arrow keys to change the selection. The selected panel name is highlighted in the Preference Panel List and the panel appears to the right of the list.

Closing the Preferences Dialog Box

Once you finish setting your global preferences, just close the window. To close the Preferences dialog box, click the Preference window's close box or choose **Close** from the **File** menu. The Preferences dialog box closes.

Now that you understand the use of the Preferences dialog box, let's explore the process of opening a CodeWarrior project.

Opening a CodeWarrior Project

Open a project file in exactly the same way you open any other file from within an application on your computer. In this step you open the `gnu_go.mcp` project file.

A project is a collection of files and settings that the IDE's compilers and linkers use to create a program or other piece of software.

To open a project choose **Open** from the **File** menu to display a file dialog box. Then locate and select the `gnu_go.mcp` project file and click Open. This file is in the `Source Examples` folder in the `Core Tutorials` folder on the *CodeWarrior Professional Reference* CD.

The IDE opens the project file and displays a Project window.

Now that you have a project open, let's explore the features of the Project window.

Using the Project Window

To effectively use the CodeWarrior IDE, you should be familiar with the Project window. The window displays lots of information about a project, so identifying and understanding that information is our next step. The Project window has these items:

- View Tabs
- Toolbar
- Project Window Columns
- Groups
- Interface Pop-ups
- Context Pop-ups

View Tabs

The Project window uses view tabs to present different faces of information in the project. Click a view tab to change the information displayed in the Project window.

Figure 5.3 View tabs in the project window

The Project window uses these view tabs:

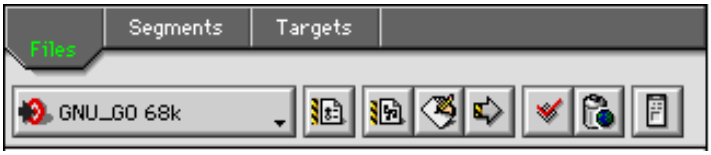
- **Files**—enables you to inspect file information in a project.
- **Link Order**—enables you to specify the order in which files are compiled.
- **Targets**— enables you configure the targets a project will build and the order in which the targets are built.

NOTE: The Link Order view sometimes has a different name. For example, when working with Mac OS 68K projects, the Link Order view becomes the Segment view.

Toolbar

The Toolbar shows icon buttons that correspond to CodeWarrior IDE commands and functions.

Figure 5.4 The default toolbar in the Project window



The toolbar appears in two formats:

- **Window Toolbar**—present in several windows within CodeWarrior, including the Project window. An example appears in Figure 5.4.
- **Floating Toolbar**—appears as a floating palette that may optionally be anchored under the IDE's menu bar.

For information on customizing, hiding, and showing toolbars, see the *IDE User Guide*.

Toolbar Tooltips

Use Tooltips to identify a button in a toolbar.

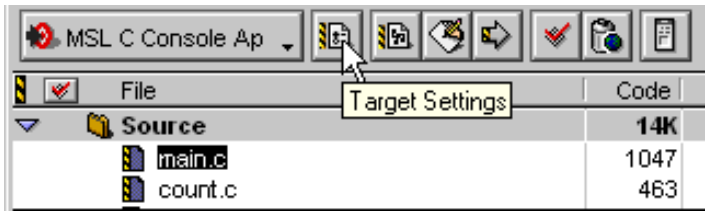
Windows To view a Tooltip, position the mouse pointer over the button without moving it for a moment.

Mac OS To view a Tooltip, press the Control key and position the mouse pointer over a toolbar button.

Solaris Toolbar Tooltips are currently unavailable for Solaris.

The Tooltip appears, describing the icon underneath the mouse pointer (Figure 5.5).

Figure 5.5 Viewing a Tooltip (on Windows)



Project Window Columns

The columns that appear in the Project window's File view are listed in the following table.

Table 5.1 Columns in the Project window

This column…	presents this information
	The Touch column indicates whether a file needs to be compiled.
	The File column identifies the names of files and groups in the project.
	The Code column shows the size of the compiled executable code.
	The Data column shows the size of non-executable data.
	The Debug column indicates whether debugging information will be generated for an item.
	The Target column indicates whether an item is in the project's current target.

This column…	presents this information
	The Checkout Status column indicates the current status of an item in a version control system. This column only appears if a version control system is active.
	The Link column indicates whether the object code generated from an item will be linked into the target. This column only appears in the Targets view.

Groups

Groups in the File view provide a way to organize project files into logical categories to help you keep track of your files. Groups do not effect the binary code produced by the compilers. The only outcome is on their organization within the Project window. They can be expanded to display their contents, collapsed to hide their contents, rearranged, added, and deleted from a project.

TIP: Groups in the **Link Order New/Segments** view might have an effect on how object code is arranged in your program. Please refer the appropriateTargeting manual for the platform specific details

Interface Pop-ups

Interface Pop-ups reveal additional information about the group or files associated with it. The two types of interface pop-ups are:

- **Group's Interface Pop-up**—displays a list of all files in that group.
- **File's Interface Pop-up**—displays a list of interface files required to compile the file, and allows you to "touch" the file which forces it to recompile on the next update or make operation.

To view an Interface Pop-up click on the pop-up menu to the right of the file or group name. The file or group interface pop-up appears.

Context Pop-ups

The two forms of Context Pop-ups available in the Project window include:

- **Group Context Pop-up**—enables you to check syntax, preprocess, precompile, compile, disassemble, or remove it from the project.
- **File Context Pop-up**—does everything the Group Context Pop-up does as well as showing the File Path, and Reveal in Finder the file's location.

To View a Context Pop-up, position the cursor over a file or group name, then click and hold the mouse button down without moving the mouse. In a moment the File context pop-up appears.

Now that you have a better understanding of the Project Manager, let's move onto the next section and tour the CodeWarrior IDE's Editor.

Using the CodeWarrior Editor

The CodeWarrior Editor window is where you will spend most of your time creating, editing, and navigating through source code for your project. This section introduces you to these editing tasks:

- Creating a New Text File
- Opening a File
- Entering Text into a File
- Saving Changes to a File

Creating a New Text File

To create a new text file, just choose **New** from the **File** menu. A new untitled editor window will appear, ready for you to enter, edit, and save text or source code.

Opening a File

There are a variety of ways to open a source code or text file from within a project.

Opening a file from the Project window

You can open any editable text file listed in the Project window. In this step you open the `main.c` file from the `gnu_go.mcp` project.

To open the `main.c` file in the Project window double-click its name in the Project window (Figure 5.6).

Figure 5.6 Opening a file from the Project window

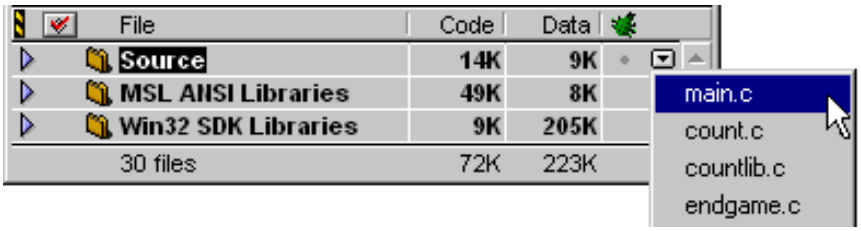
The file opens and appears in its own window.

TIP: You can also select a file in the Project window using the arrow keys and press the **Enter/Return** key to open it.

Opening a file with a group pop-up

You can also open an editable text file within a group by using the group pop-up that appears to the right of the group name. To open a file from a pop-up menu select the file from a group pop-up in the Project window (Figure 5.7).

Figure 5.7 Opening a file within a group pop-up



The file opens and appears in its own window.

Opening a file from the File menu

You can use this method to open any text file, whether it is included in the project or not. In this step you open the file `endgame.c` using the **File** menu.

To open the `endgame.c` source code file choose **Open** from the **File** menu to display a file dialog box. Locate and select the `endgame.c` file, then click Open. The file appears in its own editor window.

Entering Text into a File

Now that you have a file open in the editor, you can enter text or source code. The CodeWarrior Editor operates like a regular text editor, with many special features designed to ease navigation that are beyond the scope of this short tour.

To enter text, position the cursor at the point where you want to insert text, click the mouse button to place the insertion point, then begin typing. Your keystrokes appear at the insertion point.

Saving Changes to a File

As you modify your source code files, it's a good idea to save the changes to disk to prevent data loss. To save a file choose **Save** from the **File** menu. If the file has never been saved before, a file dialog box will appear prompting you for a location and a name for the file. Click **Save** when you are done.

The IDE saves the file.

Now that you are comfortable with the IDE's Editor, it's time to explore the Target Settings dialog box.

Setting Target Options

What is a Target?

Before we begin our Targets tour, let's get familiar with the term 'Target'. The term Target has two distinct meanings in CodeWarrior terminology. "Target" refers to either the:

- **Platform Target** - the particular operating system or microprocessor for which you are writing code. For example, if you choose to write code for a particular processor running a desktop OS, you are specifying a platform target.
- **Build Target -** the particular collection of settings and files that determine what is in your code, and how your code is compiled and linked into the final output. For example, if you choose to compile code with certain language features enabled, then you change the settings in the build target. If you choose to add or remove a file from a particular build, you are changing the build target.

The Build Target settings apply only to the current target of the current project. Settings in one project or target in a project do not affect settings in another project or target. The Build Target Settings dialog box appears very similar to the Preferences dialog box, with many common features.

Projects can contain one or more build targets. Every target in the project has its own unique settings. For example, you can have a debug target and a production target. You use the Build Target Settings dialog box to set a target's options.

This section shows you how to do these tasks with the Target Settings dialog box:

- Opening the Target Settings Dialog Box
- Viewing and Setting Options in a Settings Panel

- Closing the Target Settings Dialog Box

Opening the Target Settings Dialog Box

To change a target option, the Target Settings dialog box must be open. In this step you open the Target Settings dialog box.

To open the Target Settings dialog box choose ***Target*** **Settings** from the **Edit** menu. ***Target*** will be replaced by the name of the current target in the project file. On a PC running Windows for example, the targets include: `gnu_go x86`, and `go_debug`. On the Mac OS the targets include: `gnu_go 68K`, `gnu_go PPC`, and `gnu_go FAT`.

The Target Settings dialog box opens on the screen.

TIP: You can also double-click a target name in the Targets view to open the Target Settings dialog box.

Viewing and Setting Options in a Settings Panel

There are several different settings panels available in the Target Settings list. To set a particular target option, you must choose its panel.

To view a settings panel click the panel name in the Target Settings list, or use the Up and Down arrow keys to change the selection. The selected settings panel appears to the right of the list.

To learn about setting options in settings panels, consult the *Targeting* manual for the platform that your program will run on.

Closing the Target Settings Dialog Box

Once you finish setting the target options, just close the window. To close the Target Settings dialog box click its close box or choose **Close** from the **File** menu. The Target Settings dialog box closes.

Now that you can set Target Settings for projects, it's time to build a compiled application from the `gnu_go.mcp` project.

Building Projects with CodeWarrior

In this section we'll introduce you to ways of building a project. Among the tasks the IDE provides for compiling, linking, running, and debugging your project are:

- Updating a Project
- Making a Project
- Running a Project
- Debugging a Project
- Building a Program

TIP: Before using a command in the Project menu to compile or link your project, make sure the IDE will operate on the right target by choosing it from the **Select Current Target** sub-menu in the **Project** menu.

Updating a Project

Use **Bring Up To Date** on the **Project** menu to compile all modified or "touched" files. This process creates object code for compiled files, but does not link the code into a binary file.

Making a Project

Use **Make** on the **Project** menu to link a project into a binary file. Make only creates binary files on the hard disk, it does not interactively run the final application.

Running a Project

Use **Run** on the **Project** menu to launch the application created by your project. If the project type is not an application, the **Run** command is disabled. **Run** will update and link the code if necessary.

Debugging a Project

Use **Debug** on the **Project** menu to launch the application under control of the Debugger. You can then debug your code. **Debug** will also update and link the code if necessary.

Building a Program

In this step you name the output application for the `gnu_go.mcp` project, then compile, link, and run it.

To set the application name

Windows Open the*Target* Settings dialog box from the **Edit** menu. Choose **x86 Target** in the settings panel list, choose **Application** from the **Project Type** pop-up menu, then enter `gnu_go.exe` (without the quotes). Click **Save**.

Mac OS Open*Target* Settings dialog box from the **Edit** menu. Choose **68K Target** in the settings panel list. Then, select **Application** from the **Project Type** pop-up menu. Enter gnu_go (without the quotes) in the **Output File Name** field. Click **Save.**

Solaris Open *Target* Settings dialog box from the **Edit** menu. Choose GNU in the settings panel list. Select **Application** from the **Project Type** pop-up menu. Enter gnu_go (without the quotes). Click **Save**.

If an alert box appears asking to re-build the project, click **OK**.

NOTE: The name of *Target* in the *Target* Settings dialog box changes depending upon the target chosen in the Project window.

To build the gnu_go application

With the project information in place, it is now time to actually build the project. In this step you build the `gnu_go.mcp` project.

Choose **Run** from the **Project** menu. The IDE compiles, links, then launches the `gnu_go` application.

Congratulations! You've just compiled, linked, and executed an application using CodeWarrior.

Where to Go From Here

The IDE does many tasks to make programming easier. However, not all features are covered in this tour. In summary, the IDE allows you to find and replace text in a single file or in many files, use the browser to highlight and navigate through source code objects, and debug your program.

For a guided tour of these powerful tools, read through and do the *Core Tutorials*.

For detailed information on using these advanced features, see the *IDE User Guide*.

For specific information about developing software for an operating system or processor, refer to its corresponding *Targeting* manual.

For complete information on where to look for more information on using CodeWarrior, refer to "Using CodeWarrior" on page 59.

6

Creating a Console Application

This chapter provides you with basic information on creating simple console programs using CodeWarrior and includes pointers to resources to learn how to program using CodeWarrior.

NOTE: Please refer to our **CDWeb site** for a comprehensive listing of programming resources/online documentation information.

Console Application Tutorial

Follow the console application example appropriate for your host platform. The current tutorials include:

- Windows Console Program
- Mac OS Console Program

Windows Console Program

With CodeWarrior up and running on your PC, follow the steps below to create a simple console application.

1. **Choose New Project from the File menu.**

   A **New Project** window appears.

2. **Click Win32-x86.**

   A list of available stationery projects appear.

3. **Click C, C++.**

   The C/C++ stationery projects appear.

4. **Select the "C Console App" stationery.**

   The filename is highlighted.

5. **Click OK.**

   The **New Project** window closes and the **Name New Project As** window appears

> **NOTE:** Enable the **Create Folder** box in the **New Project** window to create a new folder for your project in the selected location

6. **Enter project name.**

   Type in a project name (we used `Test.mcp`) and give it the `.mcp` extension. This enables the IDE to recognize the project as a CodeWarrior project. Also, use the standard navigation controls to specify the folder where the project file should be saved.

7. **Click Save.**

   The **Name New Project As** window closes and a new project based upon the chosen stationery is created.

8. **Choose New from the File menu.**

   A new empty editor window opens.

9. **Choose Save from the File menu.**

   The **Save** dialog box appears. Name the source file as `Hello.c` and click **Save**. The `.c` extension enables the CodeWarrior IDE to recognize it as a source code file.

10. **Enter the example code.**

```
/* hello.c */
#include <stdio.h>
main(){
     print( "Hello Metrowerks");
     return 0;
}
```

11. **With the editor window frontmost, choose Add Window from the Project menu.**

    The **Add Files** window appears. Use this window to specify which build targets should use the `Hello.c` file.

12. **Click OK.**

    The `Hello.c` file is added to all build targets in the project window.

13. **Select `main.c` in the project window.**

    The `main.c` filename is highlighted.

14. **Choose Removing Selected Items in the Project menu.**

    The `main.c` file is deleted.

15. **Choose Run from the Project menu.**

    The console project is compiled, linked, and run.

Figure 6.1 Console output for Windows.

Congratulations! You just created a program using the CodeWarrior IDE on Windows.

Mac OS Console Program

With CodeWarrior up and running on your Macintosh, follow the steps below to create a simple console application.

1. **Choose New Project from the File menu.**

   The **New Project** window appears.

2. **Select "Std C Console Multi-Target" from the stationery list.**

   The "Std C Console Multi-Target" stationery is located in the `MacOS—>C_C++->Standard Console` folder. Use the disclosure triangles to view the contents of the stationery subfolders.

3. **Click OK.**

   The **Name New Project As** window appears.

4. **Enter the project name.**

   Type in a project name and give it the `.mcp` extension. This enables the IDE to recognize the project as a CodeWarrior project. Also, use the standard navigation controls to specify the folder where the project file should be saved.

5. **Click Save.**

   The **Name New Project As** window closes and a new project based upon the chosen stationery is created.

6. **Choose New from the File menu.**

   A new empty editor window appears.

7. **Enter the example code.**

   In the empty editor window, enter the following source code:

```
/* hello.c */
#include <stdio.h>
main() {
     printf("Hello Metrowerks");
     return 0;
}
```

8. **Choose Save from the File menu.**

   The **Save** dialog box appears. Name the source file `Hello.c` and click **Save**. The `.c` extension enables the CodeWarrior IDE to recognize it as a source code file.

9. **With the editor window frontmost, choose Add Window from the Project menu.**

   The **Add Files** window appears. Use this window to specify which build targets should use the `Hello.c` file.

10. **Click OK.**

    The `Hello.c` file is added to all build targets in the project window.

11. **Select `Helloworld.cp` in the project window.**

    The `Helloworld.cp` filename is highlighted.

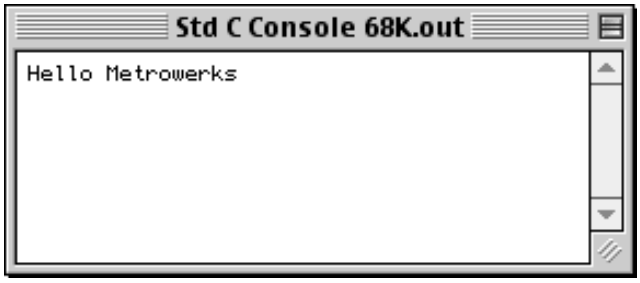
12. **Choose Removing Selected Items in the Project menu.**

    The `Helloworld.cp` file is deleted.

13. **Choose Run from the Project menu.**

    The project is compiled, linked, and run.

Figure 6.2 Console output for Mac OS.



Congratulations! You just created a program using the CodeWarrior IDE on Mac OS.

Additional Resources

Always refer to the CodeWarrior Reference Web Site at *home.htm* for a detailed description and comprehensive listing of printed and online books, online tutorials, and additional information on programming with CodeWarrior. All the information you need to get started can be found within its many files.

CodeWarrior Beginners

If you need additional instruction on using CodeWarrior, see the *Core Tutorials* to start. They cover the basics of using CodeWarrior. In addition, refer to the *IDE User Guide* and the *Debugger User Guide* for more in-depth information.

Language Beginners

For help in learning to program, see the various commercial books included with CodeWarrior. Additional reference manuals for all supported languages (C, C++, Java, and Pascal) can also be found in the *CodeWarrior Documentation* folder on the *CodeWarrior Reference CD*.

Programming Beginners

For assistance in creating programs for a particular operating system, see the appropriate Targeting manual for the project. Targeting manuals provide all the information you need to successfully program a specific processor or operating system, including additional tutorials and examples.

7

Using CodeWarrior

This chapter points you to places where you can learn more about using CodeWarrior and programming in general, where to find updates and patches to CodeWarrior software, and how to get a list of shortcut keyboard controls for the IDE. The topics covered in this chapter are:

- Learning How to Use CodeWarrior
- Online Help
- Web Sites of Interest
- Additional Reference Material
- Getting Updates and Patches
- Shortcuts

Learning How to Use CodeWarrior

Metrowerks includes a wealth of online documentation covering all aspects of programming with CodeWarrior. Metrowerks documentation files are in the `CodeWarrior Documentation` folder on the *CodeWarrior Professional Reference* CD.

Table 7.1 Core Documentation

Core Documentation	
IDE User Guide	Using the CodeWarrior IDE
Debugger User Guide	Using the CodeWarrior debugger
CodeWarrior Core Tutorials	Step-by-step introduction to IDE components
Language/Compiler Documentation	
C Compilers Reference	Information on the C/C++ compiler front end

Core Documentation	
Pascal Compilers Reference	Information on the Pascal compiler front end
Error Reference	descriptions of compiler and linker error messages, with many fixes
Library Documentation	
MSL C Reference	Reference for the Metrowerks standard C library
MSL C++ Reference	Reference for the Metrowerks standard C++ library
Targeting Manuals	
Targeting Win32/x86	Using CodeWarrior to program for Win32/x86
Targeting Mac OS	Using CodeWarrior to program for Mac OS
Targeting MIPS	Using CodeWarrior to program for MIPS®
Targeting NetYaroze	Using CodeWarrior to program for NetYaroze™
Targeting OS-9	Using CodeWarrior to program for OS-9
Targeting Palm OS	Using CodeWarrior to program for Palm OS
Targeting PlayStation	Using CodeWarrior to program for PlayStation™
Targeting PowerPC for Embedded	Using CodeWarrior to program for Embedded PowerPC™

NOTE: Not all of the listed documentation comes with every Metrowerks product. See your product's `CodeWarrior Documentation` folder on the CodeWarrior Professional Reference CD-ROM to determine which ones are included in your package.

Online Help

Need immediate help? Metrowerks provides you with online assistance through a variety of tools. Table 7.2 below describes the various document formats used with online help, and a brief discussion of their use.

Table 7.2 Online Help Formats

Format	Description
HTML (Windows, Mac OS, BeOS)	HTML can be read using your favorite HTML browser software.
PDF (Windows, Mac OS, BeOS	PDF is the Adobe Acrobat format.
WinHelp (Windows)	Some manuals are available in WinHelp format on Windows.

Check your Metrowerks product documentation to determine which online formats it supports.

Web Sites of Interest

Programming tools change fast, and access to the latest information about a particular technology or programming environment is vital. Below are some of the major Web sites where developer information can be obtained:

Table 7.3 Web sites

For information on this target …	See this Web site
Win32/x86	`http://www.microsoft.com/msdn`
Mac OS	`http://devworld.apple.com`
MIPS	`http://www.sgi.com/MIPS/`
NEC	`http://www.nec.com/`
OS-9	`http://www.microware.com/`
Palm OS	`http://palmpilot.3com.com/5024.html`
PowerPC Embedded	`http://www.mot.com/SPS/PowerPC/`
Windows CE	`http://www.microsoft.com/msdn`

Additional Reference Material

Learning to program requires additional reference materials. Metrowerks includes several wonderful programming books in the CodeWarrior Books folder on the CD. Table 7.4 lists several third-party books (found in your local bookstore) that can assist you in getting up to speed on your programming projects.

Table 7.4 Third party books of interest

To learn…	Read this book
C	*New C Primer* by Michael Waite and Stephen Prata *Teach Yourself C* by Herb Schildt *The C Programming Language, 2nd Edition* by B. Kernighan and D. Ritchie
C++	*C++ Primer Plus, 2nd Edition* by Stephen Prata *Teach Yourself C++* by Herb Schildt *The C++ Programming Language, 2nd Edition* by Bjarne Stroustrup.

To learn…	Read this book
CodeWarrior	*Metrowerks CodeWarrior Programming* by Dan Parks Sydow *Power Macintosh Programming Starter Kit* by Tom Thompson
Pascal	*Oh, Pascal!, 3rd Edition* by D. Cooper & M. Clancy
Win32/x86	*Advanced Windows®* by Jeffrey Richter *Programming Windows® 95* by Arnold Petzold
Mac OS	*Macintosh Programming Techniques* by Dan Parks Sydow *Macintosh C Programming Primer, Volume 1* by D. Mark & C. Reed *Programming Starter Kit for Macintosh* by Jim Trudeau *Ultimate Macintosh Programming* by Dave Mark

Getting Updates and Patches

Occasionally Metrowerks makes software patches and small updates available through its Web site to enhance or correct bugs in an existing CodeWarrior product. You may download these patches and apply them to the CodeWarrior software installed on your computer.

For information on the latest patches to CodeWarrior software, browse `http://www.metrowerks.com`.

Shortcuts

To get a list of keyboard shortcuts for the CodeWarrior IDE, see the *IDE User Guide*'s "Configuring IDE Options" chapter. This includes a table that lists the default key bindings in the **Key Bindings** preference panel.

A

Metrowerks Support

This chapter describes ways to contact Metrowerks with your questions on registration, site licensing, sales, and technical support.

The sections in this chapter are:

- Contacting Metrowerks
- Registration and Updates
- Technical Support
- Sales, Renewals, and Site Licensing
- Worldwide Distributors
- Metrowerks Store

Contacting Metrowerks

Use the information shown in Table 1.1 to contact Metrowerks.

Table 1.1 Contacting Metrowerks

USA	Metrowerks Corporation 9801 Metric, Suite 100 Austin, TX 78758 U.S.A. tel: (512) 873-4700 fax: (512) 873-4900

Registration and Updates

If you just bought this software, fill in the registration card and mail it to us to receive free technical support for a year from date of purchase. To register your Metrowerks product, or, if you have questions on your registration, contact Metrowerks using the information in Table 1.2.

Table 1.2 Registration support

Internet	WWW: `http://www.metrowerks.com` To register: `register@metrowerks.com` Questions: `reg-questions@metrowerks.com`
Mail	Metrowerks Corporation 9801 Metric, Suite 100 Austin, TX-78758 U.S.A. fax: (512) 873-4901

Technical Support

If you are having problems installing or using a Metrowerks product, contact Metrowerks Technical Support. Metrowerks offers technical support free of charge to registered users; however, you pay for toll charges and online service fees.

Table 1.3 Technical support

World Wide Web	`http://www.metrowerks.com`
email	`support@metrowerks.com`
newsgroup	`comp.sys.mac.programmer.codewarrior`
Compuserve	Go: `Metrowerks`

NOTE: To assist Technical Support in answering your question, please use the `email Report Forms` folder found in the `Release Notes` folder when submitting a support question.

Sales, Renewals, and Site Licensing

For information on a site license or buying a new Metrowerks product at a reduced price (with free updates, if applicable), for the U.S.A. and Canada, contact Metrowerks

Table 1.4 US and Canada distributors.

Internet	WWW: `www.metrowerks.com` Sales: `sales@metrowerks.com` Academic licensing: `academia@metrowerks.com`
Mail	Metrowerks Corporation 9801 Metric, Suite 100 Austin, TX 78758 U.S.A. fax: (512)873-4901

Worldwide Distributors

If you live outside the U.S.A. or Canada, use Table 1.5 to contact the distributor in your area for customer support, upgrades, renewals, site licensing, and sales.

NOTE: Some distributors don't sell or support CodeWarrior embedded system products. Contact the distributor nearest you for information on the CodeWarrior products that company sells.

Table 1.5 Worldwide distributors.

Australia & New Zealand
Techflow Pty Ltd
5/17 Mooramba Road
Dee Why, NSW 2099, Australia
tel: +612 9971 4311
fax: +612 9982 3623
e-mail: `sales@techflow.com.au`
WWW: `www.techflow.com.au`

Austria
Software-Schmiede GmbH.
Huetteldorfor Str. 6/9
A-1150 Vienna
Austria
tel: +43 (1) 983 36 83
fax: +43 (1) 983 36 83-9
e-mail: `mm@sw-schmiede.co.at`, `brains@brains.at`

Brazil
CAD Technology
Rue Helena 218 cj. 80
Sao Paulo SP
Brazil
tel: +55 11 829 8257
fax: +55 11 820 4485
e-mail: `cadtech@macbbs.com.br`
WWW: `www.macbbs.com.br/cadtech`

Denmark
SSA Tradings
Laplandsgade
2300 Copenhagen S
Denmark
tel: +45 32 96 2666
fax: +45 32 96 2300
e-mail: `kim@ssa.dk`

France & Belgium
AWARE
1, rue du Dahoney
75011 Paris
France
Serveur First Class: 01 43 56 97 10
tel: +33 1 43 56 57 58
fax: +33 1 43 56 66 77
e-mail: `gmasson@aware.fr`
WWW: `www.aware.fr`

France (CodeWarrior for Palm OS only))
Intervalle
159 Avenue Gallieni
93170 Bagnolet
France
tel: +49 72 58 58
fax: +49 72 58 59
e-mail: `giles.pommier@intervalle.fr`

Germany
Promo GmbH
Promo Datentechnik+Systemberatung GmbH
Eduarstrasse 46-48
D-20257 Hamburg
Germany
tel: +49 40 85 17 44-0
fax: +49 40 85 17 44 44
e-mail: `oliverk@promo.de`
WWW: `www.promo.de`

Germany (Windows® products only)
Softline GmbH
Appenweierer Strasse 45
D-77704 Oberkirch
Germany
tel: +49 78 02 92 46 00
fax: +49 78 02 92 42 40
e-mail: `softinfo@softline.de`

Hong Kong
G & B Computerware Dist. Ltd.
Unit A3 5/F Jing Hin Industrial Building
5 Wang Kee Street
Kowloon Bay
Hong Kong
tel: +852 26617181
fax: +852 26614679
e-mail: gregoryr@hk.super.net

Hungary
BertDolf BT
Keszkens u. 15. IV/9
H-1131 Budapest
Hungary
tel/fax: 361/330-5038
e-mail: bertdolf@starkingnet.hu

Iceland
Skúli Valberg Ólafsson
EJS
Grensásvegi 10
IS-108 Reykjavík
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tel: +354 563 3000
fax: +354 568-8487
e-mail: skuli@ejs.is
ymin@ejs.is
sidar@ejs.is

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Tel-Aviv 67771
Israel
fax: 972 3 5372928
e-mail: dreyer@kalanit.co.il

Italy
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c/o Apple Computer Spa
Via Lanino 5
20144 Milano
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tel: +39 477891
fax: +39 47789250
e-mail: metrowerks@essai.it

Japan
B.U.G. Inc.
Tanaka Bldg., 1F, 1-1-36
Kiyoto 1-jyo, Toyohira-ku
Sapporo, 004
Japan
tel: +81 3 3486 6710
fax: +81 3 3486 6702
e-mail: cw-register@bug.co.jp

Korea
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Youngdeungpo-gu,
Seoul, 150-010, Korea
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Fax: +82-2-2783-8653
Email: benson@mis.co.kr
WWW: http://www.mis.co.kr

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Udagawa-cho 36-6, Shibuya-ku
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fax: +8133 780 6092
e-mail: j-info@metrowerks.com
WWW: www.metrowerks.com

Russia
DPI Co.
39, Nizhnaya Krasnolelskaya St.
Moscow 107066
Russia
tel: +7(095)956 3974
fax: +7 (095) 264-2946
email: degs@apple.ru

Singapore
DOML International Pte. Ltd.
100 Eu Tong Sen Street
#04-15 Pearl's Centre
Singapore 059812
Republic of Singapore
tel: +65 227 5455
fax: +65 224 0279
email: sales@doml.com.sg

Sweden (CodeWarrior for Palm OS only)
Datanat AB
P.O.Box 532
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Sweden 445 43 80-9
tel: +46 08 544 106 00
fax: +46 08 544 106 44
email: claesb@datant.se

Singapore
InStep
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Singapore 347780
Tel: +65 741 7507
Fax: +65 741 1478
Email: nkling@instep.com.sg

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221 00 Lund
Sweden
tel: +46 46 31 22 22
fax: +46 46 30 53 39
e-mail:
`reine.lundgren@studentlitteratur.se`
WWW: `www.studli.se`

Switzerland
Innoware AG
Stationsstrasse 53
Postfach
CH-8603 Schwerzenbach (in Zurich)
Switzerland
tel: +41 1 908 44 00
fax: +41 1 908 44 10
E-mail: `bvetter@innoware.ch`

South Korea
Elex Computer
Elex Bldg.
40-17 Hangangro 3-ga
Yongsan-ku
Dept. Developer Support
Seoul, Korea 140-013
tel: +82 2709 8317
fax: +82 2709 8453
e-mail: `it0103@applelink.apple.com`

Taiwan
Photin (Attn: Jolios Lin, Prod. Mgr.)
FL. 8-1, No. 174, FU-HSIN N. Rd.
Taipei
Taiwan R.O. C.
tel: +886 2 545 5216
fax: +886 2 514 0377
e-mail: `jolios@email.photin.com.tw`

Ukraine
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65 Peremohy Pr.
Kyiv, Ukraine, 254062
tel: +380 44 442 9295
fax: +380 44 443 1201
e-mail: `macukraine@aol.com`

UK, & Ireland
Full Moon Software
PO Box 862
Maidenhead
Berks, SL6 0QJ
United Kingdom
tel: +44 1628 660242
fax: +44 1628 666084
e-mail: `sales@fullmoon.com`
WWW: `www.fullmoon.com`

Metrowerks Store

Visit the online locations in Table 1.6 to view the Metrowerks Store catalog and see Table 1.7to purchase an item directly from Metrowerks.

Table 1.6 Online Geekware catalogs

WWW	URL: `http://www.metrowerks.com`
Compuserve	Go: `Metrowerks`

Table 1.7 Catalog sales

Telephone	tel: (800) 377-5416 fax: (512) 873-4901

B

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Appendix A - Software Redistribution Information for CodeWarrior SDK

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These files in object code form only and bundled with Licensee software only, can be distributed by Licensee to end users directly or indirectly through dealers, distributors, VARs, OEMs and other relicensors.

Metrowerks Software and Redistributable Libraries

*The PowerPlant Library and sample code in object code form

*The Metrowerks Standard Library and sample code in object code form

*The Latitude Library and sample code in object code form

Note: Licensees may not distribute the source code of the PowerPlant Library, Metrowerks Standard Library, Latitude Library any derivative thereof, or sample code thereto, without express written permission from an authorized officer of Metrowerks Corp.

The Java VM and associated runtime libraries contained in the RedistributableVM.sit archive found in the Java support folder.

For any additional information on Metrowerks-licensed software write or email to: Metrowerks Corp., 9801 Metric, Suite #100, Austin, TX, 78758, USA. email: support@metrowerks.com

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Apple Computer Software and Redistributable Libraries

Object-code derivations of sample code and final versions of the following files:

* AppleScript runtime files (AppleScript, Inline Filter, AppleScriptLib, ObjectSupportLib, Beep, Choose Application, Choose File, Current Date, Display Dialog, File Commands, Load Script, New File, Numerics, Read/Write Commands, Run Script, Scripting Components, Store Script, String Commands, Time to GMT, English Dialect).

* XTND runtime files (Claris XTND System, contents of Claris Translators folder, XTNDInterfaceLib.o, XTNDInterfaceLib.o, XTND Power Enabler).

* MacODBC runtime files (ODBC Configuration Manager, ODBC Setup, ODBC

Driver Manager).

* Serial Switch

* Thread Manager

* Sound and Sound Manager

* File System Manager

* Macintosh Drag and Drop, Clipping Extension, and Dragging Enabler, provided that the Licensee includes in a conspicuous place on the exterior of the packaging of the licensee programs, the following language: "Macintosh Drag and Drop included".

* MacApp provided that the Licensee includes in a conspicuous place on the exterior of the packaging of the licensee programs, the following language: "Macintosh Drag and Drop included".

* Apple Shared Library Manager files: Shared Library Manager and ASLM Resources

* AppleSearch Client, AppleSearch Authentication, AppleSearch Communication, and ASClientLib.o.

* Apple Guide

* UGLibrary.o (Appleshare API glue)

* Apple MIDI Driver and MIDI Manager

* Mathlib

* Telephone Manager and TelMgrGlue.o

* The following Communications Toolbox files: CTB Resources, CommToolboxExtensions.o, Apple Modem Tool, Text Tool, AppleTalk ADSP Tool TTY Tool, XMODEM Tool, VT102 Tool, SerialTool, TTYFont, VT102Font, ADSP, AdminLAT, LAT, LAT Prep, and LAT Tool

* The following MacSNMP, MacTCP, and MacX25 files: SNMPLibrary.cln.o SNMPLibrary.clf.o, LibraryManager.n.o, LibraryManager.o, LAP802.a.o, LAP802.c.o, LAP802Arp.c.o, LAP802Mdev.c.o, LAPAsmUtil.a.o, LAPloopBack.a.o, FSDES.o, IPCGlue.o, X25_Interface_Library.o

* The following Network Software Installer files: Apple Token Ring NB, AppleTalk, EtherTalk Phase 2, Network, Responder, Token Ring, TokenTalk Phase 2, and TokenTalk Prep

* The following MacTCP-related HyperCard XCMDs (built from the sample source code in the HyperCard MacTCP Toolkit folder): TCPActiveOpen, TCPCharsAvailable, TCPClose, TCPNameToAddr, TCPOverview, TCPPassiveOpen, TCPRecvChars, TCPRecvMsg, TCPRecvUpTo, TCPRelease, TCPSend, TCPState, and TCPVersion

For any additional information on Apple-licensed software contact Apple's Software Licensing Department at the following address for further information: Software Licensing Department Apple Computer, Inc. 2420 Ridgepoint Drive, MS: 198-SWL, Austin, TX, 78754 Telephone: 512/919-2645 AppleLink: SW.LICENSE

CodeWarrior

QuickStart Professional

Credits

writing lead: Roopa Malavally

other writers: Marc Paquette, L. Frank Turovich

engineering: all CodeWarrior R&D teams

frontline warriors: Roger Aradi, Amy Dykes, Ron Liechty, Steve Smith, Sebastien Taveau, L. Frank Turovich, CodeWarrior users everywhere

Guide to CodeWarrior Documentation

CodeWarrior documentation is modular, like the underlying tools. There are manuals for the core tools, languages, libraries, and targets. The exact documentation provided with any CodeWarrior product is tailored to the tools included with the product. Your product will not have every manual listed here. However, you will probably have additional manuals (not listed here) for utilities or other software specific to your product.

Core Documentation	
IDE User Guide	How to use the CodeWarrior IDE
Debugger User Guide	How to use the CodeWarrior debugger
CodeWarrior Core Tutorials	Step-by-step introduction to IDE components
Language/Compiler Documentation	
C Compilers Reference	Information on the C/C++ front-end compiler
Pascal Compilers Reference	Information on the Pascal front-end compiler
Error Reference	Comprehensive list of compiler/linker error messages, with many fixes
Pascal Language Reference	The Metrowerks implementation of ANS Pascal
Assembler Guide	Stand-alone assembler syntax
Command-Line Tools Reference	Command-line options for Mac OS and Be compilers
Plugin API Manual	The CodeWarrior plugin compiler/linker API
Library Documentation	
MSL C Reference	Function reference for the Metrowerks ANSI standard C library
MSL C++ Reference	Function reference for the Metrowerks ANSI standard C++ library
Pascal Library Reference	Function reference for the Metrowerks ANS Pascal library
MFC Reference	Reference for the Microsoft Foundation Classes for Win32
Win32 SDK Reference	Microsoft's Reference for the Win32 API
The PowerPlant Book	Introductory guide to the Metrowerks application framework for Mac OS
PowerPlant Advanced Topics	Advanced topics in PowerPlant programming for Mac OS
Targeting Manuals	
Targeting Java VM	How to use CodeWarrior to program for the Java Virtual Machine
Targeting Mac OS	How to use CodeWarrior to program for Mac OS
Targeting MIPS	How to use CodeWarrior to program for MIPS embedded processors
Targeting NEC V810/830	How to use CodeWarrior to program for NEC V810/830 processors
Targeting Net Yaroze	How to use CodeWarrior to program for Net Yaroze game console
Targeting Nucleus	How to use CodeWarrior to program for the Nucleus RTOS
Targeting OS-9	How to use CodeWarrior to program for the OS-9 RTOS
Targeting Palm OS	How to use CodeWarrior to program for PalmPilot
Targeting PlayStation OS	How to use CodeWarrior to program for the PlayStation game console
Targeting PowerPC Embedded Systems	How to use CodeWarrior to program for PPC embedded processors
Targeting VxWorks	How to use CodeWarrior to program for the VxWorks RTOS
Targeting Win32	How to use CodeWarrior to program for Windows